

**What is claimed is:**

1. A method of manufacturing a semiconductor device, comprising the steps of:

5 providing a semiconductor substrate for which given processes for forming the semiconductor device are implemented; and

implanting a 3 balance dopant having a higher atomic weight than boron and made of monoatomic at a given depth of the semiconductor substrate by means of an ion implantation process, thus forming an ion implantation layer.

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2. The method as claimed in claim 1, further comprising the step of forming a screen oxide film on the semiconductor substrate before the dopant is implanted.

15 3. The method as claimed in claim 1, wherein the ion implantation process includes implanting a dopant of  $5E11 \sim 1E13 \text{ ion/cm}^2$  with energy of  $10 \sim 50 \text{ KeV}$ .

4. The method as claimed in claim 1, wherein the dopant is  
20 indium.

5. The method as claimed in claim 1, wherein the ion implantation process includes implanting the dopant at a tilt angle of  $3 \sim 13^\circ$ .

6. The method as claimed in claim 1, further comprising the step of implementing a rapid thermal process in order to activate the dopant after the ion implantation layer is formed.

5 7. The method as claimed in claim 6, wherein the rapid thermal process is implemented at a temperature of 800 ~ 1100°C at the ratio of 20 ~ 50 °C/sec for 5 ~ 30 seconds.

8. The method as claimed in claim 6, wherein the rapid thermal  
10 process is implemented under a nitrogen atmosphere.